

ABSTRACT

An improved method of tracking a catheter's position within a human body does not rely on x-rays, but instead calculates the position of the catheter's imaging head by analyzing image data. Such an analysis is able to determine the position of the imaging head in 3 dimensional space, relative to an arbitrarily selected reference image. An image is compared with the reference image, correlation data between corresponding points on the two images are gathered, and a correlation loss rate in a particular direction is determined. This correlation loss rate is modeled to an exponential function, which is evaluated to estimate an angle of separation between the image and the reference image. One or more angles of separation are used to determine a position in three dimensional space of the image, relative to the reference image. By repeating this process for a series of images being gathered by a catheter, the position of the catheter can be determined. Additionally, a 3 dimensional map of lumens in the human body can be created.

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